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ABSTRACT

This individualized learning manual deals with the mechanics of information retrieval of the ERIC files, using the RIC program of North Dakota. The material covered includes formulating a basic search strategy, identifying major concepts, the mechanics of computer searching, and the unique properties of the ERIC system. Each discussion contains illustrations and examples as well as a summary of important points. The appendix includes 19 worksheets, 15 answer sheets, a listing of the national dissemination coordinators, a listing of the 16 ERIC Clearinghouses, a glossary, and 1 page bibliography. The manual is designed to be used in conjunction with the media kit, "ERIC: What It Is, How To Use It," and the pamphlet, "What Is the Question? A Guide for Search Negotiation." (NR)

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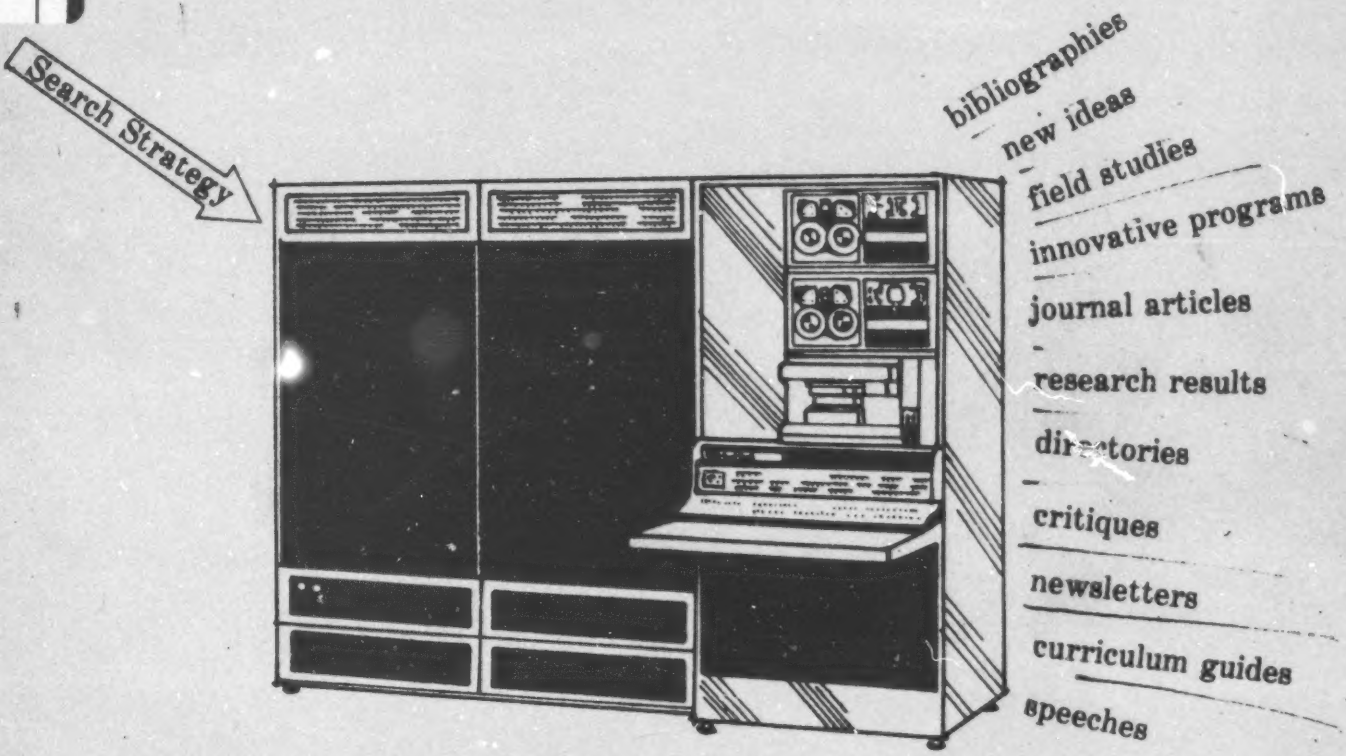

Learning Activity Packet
Regional Educational Service Center

IR 002 890

A MANUAL FOR SEARCH STRATEGY

for

COMPUTERIZED INFORMATION RETRIEVAL

developed by

Nancy Flott

Kansas State Department of Education
Kansas State Education Building
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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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I am grateful to the National Institute of Education, who provided a special purpose grant for the workshops where the LAP was used.

And finally, I acknowledge my understanding children who "fended" for themselves many times while "Mom" worked on her project.

Introduction

ERIC documents and journal articles are available to educators through either a manual or computer search process. Use of the computer allows rapid retrieval of information designed to meet the needs of the searcher. Several states are establishing information centers and are training their staffs in retrieval techniques. At present, there are very few training materials available and, due to the scarcity of retrieval specialists, workshops or one-to-one instruction sessions are expensive and impractical.

This Learning Activity Package (LAP) is designed to teach you the techniques necessary for computerized searching of the ERIC files, but, there is no need for any computer experience or training background. The strategy used in this LAP will apply to searching the ERIC files, but could be used with other computer-retrievable information systems. Self-instruction materials such as this LAP could possibly train educators to develop strategy for searching the ERIC files, as well as other available data bases.

Maybe you have hand searched *Resources in Education* and *Current Index to Journals in Education* in your local library and found it time-consuming. Maybe you have used the services of a near-by educational information center for computerized searching, and discovered that you saved a great deal of your valuable time. Hopefully you will realize even more efficiency after you have completed this LAP and can formulate your own search strategy and submit your own and others' searches to the computer.

This LAP should be used with the media kit, "ERIC: What it is, How to use it" and the pamphlet, "What is the Question? A Guide for Search Negotiation."

A filmstrip projector and a cassette tape recorder (or a combination of these) will be needed to utilize the media kit. Other "tools" needed with this LAP are:

1. Background information on local dissemination/diffusion effort.
2. A program for computer searching of the ERIC files (such as the RIC program of South Dakota, used in this LAP).
3. Hardware for computer searching of the ERIC files.
4. *Descriptor/Identifier Usage Posting*, (not absolutely necessary).

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OBJECTIVE

After working through the Computerized Information Retrieval Learning Activities Package (LAP), you will be able to perform acceptable search strategy on three simulated searches.

METHOD OF EVALUATION

You will perform three simulated searches to be judged according to the criteria established by a panel of experienced search strategists.

BASIC EQUIPMENT FOR THE LEARNING ACTIVITY PACKAGE

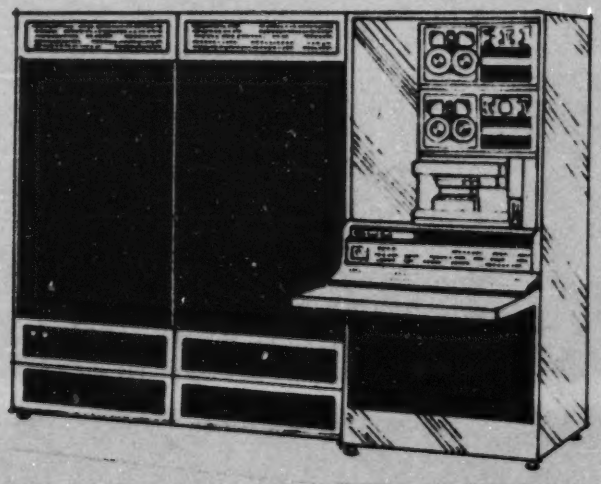
Before starting this LAP, please view sound filmstrip #3 in the "ERIC: What it is and how to use it" kit. Follow the instructions carefully and do the exercises that are suggested.

It is assumed that you are familiar with local efforts in your area for disseminating and diffusing educational information materials. If you are not familiar with the activity in your state, please STOP HERE and contact the designated information officer in your state (see list in Appendix). If you *are* familiar with the dissemination activities in your state, proceed to the next section.

Keeping in mind the techniques you learned by using the "ERIC: What it is, How to use it" media kit, glance at the *Thesaurus* found in your package and compare it to the "mock up" in the kit. Also check to see that the other items included in your LAP, in addition to this manual are:

1. Worksheets
2. Descriptor/Identifier Usage in RIE and CIJE

A glossary of computer retrieval terms is in the Appendix. Consult it for definitions of unfamiliar terms. ANSWER SHEETS are at the back of this manual.



BASIC SEARCH STRATEGY

This Learning Activity Package (LAP) will deal with the mechanics of computer searching of the ERIC files, using the RIC program of North Dakota. The basic search strategy as explained here, however, with minor alterations, could be used with any computerized information retrieval system, whether batch or online. Selecting descriptors and formulating search strategy are basic skills needed by all those who wish to use a computer for searching a data base, whether the format be abstracts, (as ERIC), titles, or whole documents. Search negotiation is covered in a separate document and should be read following the completion of this package.

The first step in formulating search strategy is to become familiar with the data base. After using the media kit, "ERIC: What it is, how to use it", you should be familiar with ERIC and it is assumed that you have access to the complete ERIC files and can already see the advantages of computer retrieval, especially when multiple concepts are involved. If you or your client wish information on individualized instruction in mathematics in the elementary grades, hand searching of RIE (*Resources in Education*) and CIJE (*Current Index to Journals in Education*) would be impossible. Simple one or two-term searches involving hundreds of documents are equally difficult.

In addition to manipulating multiple concepts, computerized information retrieval also allows for unique combinations of descriptors which can retrieve a document or documents covering specific subjects, more nearly satisfying the needs of you or your client.

IDENTIFYING MAJOR CONCEPTS

After negotiating a search (see accompanying paper, "What is the Question? A Guide for Search Negotiation") you must be able to identify the major concepts (sometimes as few as one, but can be several). An easy way to be aware of major concepts is to *underline key words* on the Search Request Form. (See Figure 1).

CONTRACT FOR COMPUTERIZED LITERATURE SEARCH
Kansas Information Diffusion System

Name Jane Doe Date September 5

Organization USD #369

Address 510 Main (Street) Burrton (City) 78083 (Zip)

Describe the topic about which you are seeking information:

I would like some information about elementary students who have learning disabilities.

FILES TO BE SEARCHED

☒ RIE $5.00
110,000 documents of Resources in Education 1966 to present

☒ CIJE $5.00
115,000 Abstracts of current journal articles in education 1969 to present

☐ AIM/ARM $5.00
7,000 documents of Vocational and Technical Education 1966 to present

Figure 1. Key Words Underlined on Search Request Form

Turn now to WORKSHEET #1 and underline the key concepts in the search. Check your answers on ANSWER SHEET #1.

Referring again to Figure 1, where the major concepts are identified as (1) elementary students, and (2) learning disabilities. You would now enter these "variables" on a Search Strategy Form, as illustrated in Figure 2.

SEARCH STRATEGY FORM

Name Jane Doe Search Number 1041

Describe the topic about which you are seeking information:

I would like some information about elementary students who have learning disabilities.

VARIABLE – elementary students

VARIABLE – learning disabilities

Figure 2. "Variables: on Search Strategy Form

Refer to the searches on WORKSHEETS #2 and #3 and transfer the key concepts to the variable forms. Check ANSWER SHEETS #2 and #3.

After the variables have been identified, the searcher then turns to the "Rotated Descriptor Display" in the *Thesaurus of ERIC Descriptors* (p. 259) (see Figure 3 for sample section) to choose other descriptors using the key words. The variable *may* or *may not* be an appropriate descriptor.

ELEMENTARY EDUCATION
ELEMENTARY GRADES
UNGRADED ELEMENTARY PROGRAMS
ELEMENTARY SCHOOL COUNSELING
ELEMENTARY SCHOOL COUNSELORS
ELEMENTARY SCHOOL CURRICULUM
ELEMENTARY SCHOOL GUIDANCE
ELEMENTARY SCHOOL LIBRARIES
ELEMENTARY SCHOOL MATHEMATICS
ELEMENTARY SCHOOL ROLE
ELEMENTARY SCHOOL SCIENCE
ELEMENTARY SCHOOL STUDENTS
ELEMENTARY SCHOOL SUPERVISORS
ELEMENTARY SCHOOL TEACHERS
ELEMENTARY SCHOOLS
BIRACIAL ELEMENTARY SCHOOLS

Figure 3. Sample Page from Rotated Descriptor Display in Thesaurus of ERIC Descriptors

With the rotated display, you can start with the key concepts in your problem statement and label them with descriptors before you get tangled up in an index or listing. It cuts down on endless, aimless page-flipping, serves as an introduction to the descriptors available for searching, and gives you some indication of how many and what descriptors contain any of the concepts you have used.

Since there are many similar terms in the *ERIC Thesaurus*, and all must be used to perform a comprehensive search, space is allotted on the Search Strategy Form for listing all possible descriptors. (See Figure 4).

SEARCH STRATEGY FORM

Name Jane Doe Search Number 1041

Describe the topic about which you are seeking information:

I would like some information about elementary students with learning disabilities

VARIABLE - elementary students
elementary education
elementary grades
elementary schools
elementary school students

VARIABLE - learning disabilities
learning difficulties
learning disabilities

Figure 4. Search Strategy Form with Variables and Terms from Rotated Descriptor Display

The searcher must be careful to group similar descriptors within the same variable (refer again to Figure 4).

Read carefully the three sections on "Cross Referencing" (pp. viii-xii) of "The Role and Function of the Thesaurus in Education" by Dr. Frederick Goodman in the *Thesaurus*. Also, as you progress through this LAP, refer frequently to the "Summary of Contents", pp. xxi-xxii for explanation of format and terms used in the *Thesaurus*.

After you have read the above article, try the whole process on a search—identifying the main concepts, underlining the key words, transferring the key words to the "variable" sheet and checking the rotator display in your *Thesaurus* for additional terms. (See WORKSHEET #4).

Still using WORKSHEET #4, explore the "Descriptor" section of the *Thesaurus* and trace the main entries and add broader terms (BT), narrower terms (NT), and related terms (RT). CAUTION: Be careful not to use UF (Used For) terms. They are unauthorized terms which refer you to "authorized" descriptors. Compare your form with the one on ANSWER SHEET #4.

Do the same with the other four sample searches in your package (WORKSHEETS #5, 6, 7, and 8), checking each one with the corresponding ANSWER SHEETS to see how your strategy compares with the specialists'. *Do not* be concerned if it varies, as there are many strategies that are acceptable in searching.

Refer as needed to the "mock up" RIE and CIJE publications in the ERIC media kit to see how descriptors "fit" the abstracts used as examples. (See kit, "ERIC: What it is, how to use it").

SUMMARY

Basic search strategy consists of:

1. Familiarizing yourself with the data base.
2. Reading the search request and underlining the key words.
3. Transferring key words to the search strategy form as "variables".
4. Selecting descriptors from the Rotated Descriptor Display.
5. Selecting additional descriptors from the Descriptor list.
6. Being sure that you grouped "like" descriptors together.

MECHANICS OF COMPUTER SEARCHING

In order to understand the search strategy just performed, let us see what happens to it now. In most search systems, the descriptors, as well as the search number, with the proper punctuation and "operators" (conjunctions which combine or separate descriptors) will be submitted to the computer. The computer then searches for these descriptors and finds ED (Educational Document) or EJ (Educational Journals) numbers listed under them. In other words, it is searching the *Descriptor/Identifier Usage Postings.* The ED and EJ numbers for each descriptor are then stored in a memory bank. See Figure 5.

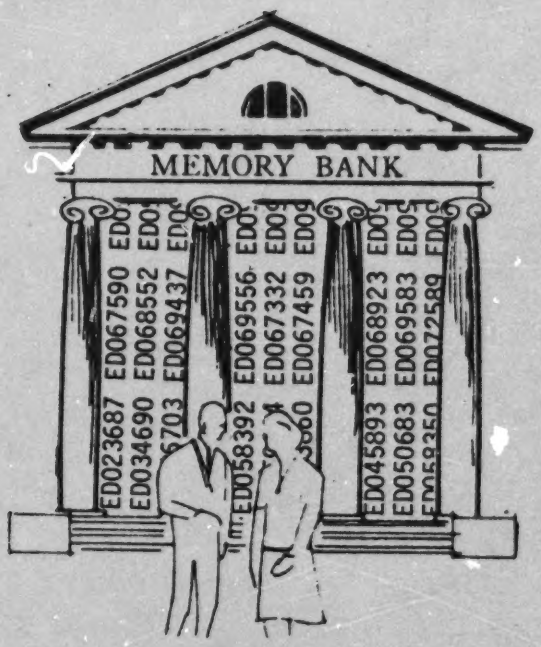


Figure 5. ED Numbers Stored in Memory Bank

The computer then goes to the next descriptor and repeats the operation, storing all the ED and EJ numbers listed there in another memory bank. See Figure 6.

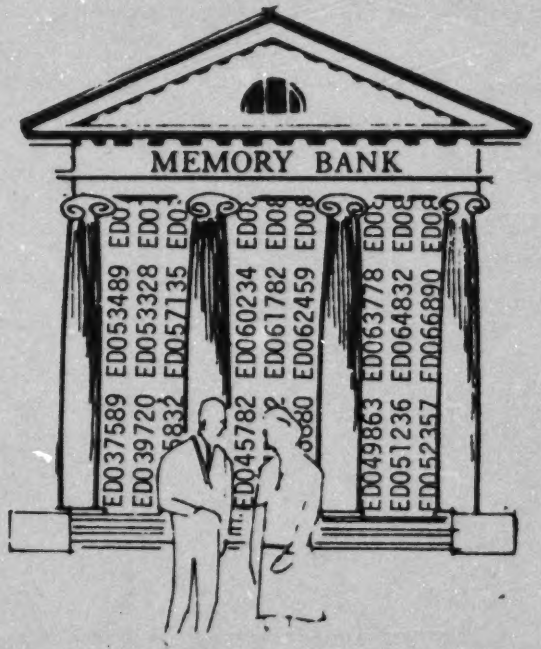


Figure 6. ED Numbers Stored in Second Memory Bank

After all of the ED and EJ numbers for the descriptors are stored, the computer then compares these numbers and prints only those which "match". This is called a

"hit". This system insures you that your "hit" document has each variable (ELEMENTARY SCHOOL STUDENTS *and* LEARNING DISABILITIES). This "hit" document then should be about elementary school students with learning disabilities. See Figure 7.

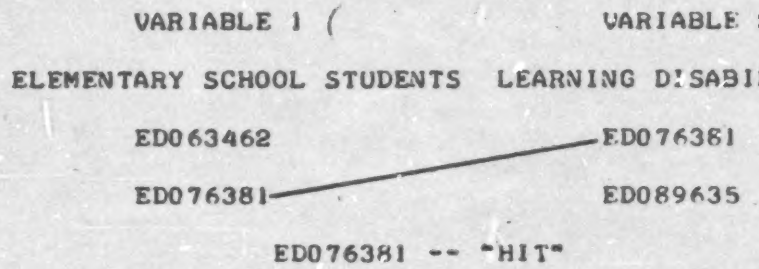


Figure 7. "Hit" Document That Has the Common Descriptors, Elementary School Students and Learning Disabilities

A simple search, however, with only one descriptor in each variable, (such as the one in Figure 7, with ELEMENTARY SCHOOL STUDENTS and LEARNING DISABILITIES) may not produce very many hits. You can now combine the other descriptors found in the Rotated Descriptor Display *and* the descriptors from the "Descriptor" section of the *Thesaurus*. Be sure to use the conjunction "or" between them. (See Figure 8.)

ELEMENTARY EDUCATION.OR.
ELEMENTARY GRADES.OR.
ELEMENTARY SCHOOLS.OR.
ELEMENTARY SCHOOL STUDENTS

.AND.

LEARNING DISABILITIES.OR.
LEARNING DIFFICULTIES

Figure 8. All Descriptors to be Searched

The computer then stores all of the ED and EJ numbers under elementary education, elementary grades, elementary schools and elementary school students in a memory bank. It also stores all of the ED and EJ numbers under learning disabilities and learning difficulties. It then compares the ED and EJ numbers stored in the "elementary students" variable with the numbers stored in the "learning disabilities" variable and prints the "matches" or "hits". On WORKSHEET #9, identify the "hits" in the descriptor postings under each variable. Check your ANSWER SHEET #9. The "or" operator expands each variable to include more documents and journal articles, thus usually more "hits". This search strategy can be used for any number of variables—up to fifteen.

To summarize, then, any number of descriptors can be used to make up each variable. There can be up to fifteen variables. To differentiate between variables, use the operator "AND"; to separate descriptors in the *same* variable, use the operator "OR". See Figure 9.

```
ELEMENTARY EDUCATION•OR•ELEMENTARY SCHOOLS•OR•
ELEMENTARY GRADES•OR•ELEMENTARY SCHOOL CURRICULUM
•OR•ELEMENTARY SCHOOL STUDENTS

•AND•

LEARNING DISABILITIES•OR•LEARNING DIFFICULTIES•OR•
MINIMALLY BRAIN INJURED•OR•PERCEPTUALLY HANDICAPPED
•OR•READING DIFFICULTY•OR•NEUROLOGICALLY HANDICAPPED
```

Figure 9. Use of Operators "AND" and "OR"

On WORKSHEETS #10 and #11, add the "OR's" and "AND's" in their proper places. Check with ANSWER SHEETS #10 and #11.

The term "NOT" *can* replace "AND" if there is a variable you wish to eliminate. To change the example in Figure 9 to include all materials *except* those on the elementary level, substitute "NOT" for "AND". See Figure 10.

```
LEARNING DISABILITIES•OR•LEARNING DIFFICULTIES•OR•
MINIMALLY BRAIN INJURED•OR•PERCEPTUALLY HANDICAPPED
•OR•READING DIFFICULTY•OR•NEUROLOGICALLY HANDICAPPED

•NOT•

ELEMENTARY EDUCATION•OR•ELEMENTARY SCHOOLS•OR•
ELEMENTARY GRADES•OR•ELEMENTARY SCHOOL CURRICULUM
•OR•ELEMENTARY SCHOOL STUDENTS
```

Figure 10. Use of Operator "NOT"

The search in Figure 10, would include all those documents and journal articles on the secondary level (junior and senior high), higher education, adults, etc. as well as those with no level specified.

To put your "search" in final form for the computer using the same descriptors for documents or journal articles, enclose each variable in parentheses—(ELEMENTARY SCHOOL STUDENTS OR ELEMENTARY EDUCATION).AND.(LEARNING DIFFICULTIES.OR.LEARNING DISABILITIES)$. If you have more than TWO variables, enclose two of them in double parentheses (ELEMENTARY EDUCATION.or.ELEMENTARY SCHOOL STUDENTS).AND.((LEARNING DISABILITIES.or.LEARNING DIFFICULTIES.or.NEUROLOGICALLY HANDICAPPED).AND.(DIAGNOSTIC TESTS.or.EDUCATIONAL DIAGNOSIS))$, making sure you always have as many left parentheses as right ones. Close your search strategy with a $. See completed search in Figure 11.

```
(INDIVIDUALIZED CURRICULUM•OR•INDIVIDUALIZED INSTRUCTION
•OR•INDIVIDUALIZED PROGRAMS•OR•INDIVIDUALIZED READING)
                    •AND•
((ELEMENTARY EDUCATION•OR•ELEMENTARY GRADES•OR•ELEMENT
ARY SCHOOL CURRICULUM•OR•ELEMENTARY SCHOOLS•OR•ELEMENT
ARY GRADES•OR•ELEMENTARY SCHOOL STUDENTS)
                    •AND•
(HUMANITIES•OR•HUMANITIES INSTRUCTION))$
```

Figure 11. The Use of Parentheses and Closing Symbol

Now, try your hand at the format for search strategy for the two sample searches on WORKSHEET #12. Compare them with ANSWER SHEET #12.

SUMMARY

The mechanics of computer searching include:

1. Performing basic search strategy.
2. Adding "AND", "OR", and "NOT" to combine or separate descriptors and variables.
3. Adding parentheses and closing symbol. If three or more variables, enclose two of them in double parentheses.
4. Submitting search to computer.
5. Computer searching for descriptors and storing ED and EJ numbers listed under them.
6. Computer printing all ED and EJ numbers *common* to all variables ("hits").

UNIQUE PROPERTIES OF THE ERIC SYSTEM

Each data base has unique properties which will be discovered through usage. When the data base is a national system, many people with varied ideas are contributing to the system. As a data base grows, techniques are modified, concepts change, and the system becomes more complicated.

Since ERIC's creation in 1965, concepts and techniques of the system and it's contents have changed. Also, as is true of all data bases, there are unique properties peculiar to ERIC. This section of your LAP will be based on these unique properties and your understanding of them.

The major components of the ERIC system are: a closed thesaurus of subject headings, educational documents on microfiche (except articles indexed in *Current Index to Journals in Education* (CIJE) which must be read in the journals or in "copy" form), abstracts of documents and journal articles (in paper copy and on computer tapes), and the machinery to read and reproduce microfiche.

Many terms found in the *Thesaurus of ERIC Descriptors* are quite broad; therefore, they could be used to describe many documents and journal articles. If you wish only those which have the descriptor as a key subject or main concept, indicate this with an * preceding the term. To determine the number of times a descriptor is used in the system, consult the current edition of the *RIE/CIJE Usage Report* (in your package) or the latest volume of *Descriptor/Identifier Postings.* From these listings you can approximate the number of retrieved documents and journal articles your strategy will produce. If there are two variables, approximately 17% of the largest descriptor file (total number) will be "hits". If there are three variables, it will be reduced to 1%.

Before proceeding in this LAP, do WORKSHEET #13 and check your answers with ANSWER SHEET #13.

If your search contains reference to a specific person, geographical location, trade name, project name, or any proper noun, you will want to check the IDENTIFIER file of the *RIE/CIJE Usage Report* or the *Descriptor/Identifier Postings* to see if the specified term is authorized and used in the system. Any term listed in the *RIE/CIJE Usage Report* not listed in the Thesaurus is an *identifier.* Identifiers are listed in separate volumes in the *Descriptor/Identifier Postings* book. Identification can be major (*) or minor also. Identifiers do not appear in the Thesaurus, but are used like descriptors in the search strategy. They are not cross-referenced or structured in any way, but do provide additional indexing depth and better "search precision." (See Figure 12).

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INDIVIDUALIZED INSTRUCTION

INDIVIDUALIZED PROGRAMS

LAP

LEARNING ACTIVITY PACKAGE
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Figure 12. Search Strategy Including Identifiers

Turn now to WORKSHEET #14 and form the search strategy for the sample "2 variable" search given. Use identifiers for in-depth searching. Compare your strategy with ANSWER SHEET #14. Next try the "3 variable" search on WORKSHEET #15 and compare with ANSWER SHEET #15.

As stated before, as the file grows and changes, the indexing system must grow and change. Unique characteristics surface, but can be handled in various ways through experimenting with the data base. Listed below are a few random thoughts for those who are learning to search the ERIC files:

1. Computerized information retrieval is an automated bibliographic service (in library terminology).
2. A common criticism of the *Thesaurus* is the multiplicity of terms used. Sometimes this can be an asset, also.
3. Some documents in the ERIC files have "hidden" contents and subtleties.
4. There are limitations in machine searching. Sometimes hand searching is easier and faster.
5. Negotiation with the client is the most important step in the search procedure.
6. The personal biases of the searcher are difficult to ignore, when he/she is the intermediary.
7. Experience is the best teacher here, too!
8. Sometimes there is no descriptor representing the concept. You may have to combine or substitute descriptors. Check RIE and CIJE abstracts often to see how they are assigned by the ERIC Clearinghouse abstractors.
9. Some descriptors are too broad; some are too specific. Use the major descriptor symbol (*) when necessary.
10. Some clients are researchers; some are practitioners. There are ERIC documents and journal articles for both types.
11. Sometimes it is better to "not" unwanted academic levels rather than include descriptors such as "secondary education" because academic levels may not be assigned to all documents and articles.
12. The *Thesaurus* is alphabetized "letter by letter" rather than "word by word."
13. On-line" searching allows the searcher to submit his strategy, display the results immediately, modify it, and display it again until he/she is satisfied with the results. With "batch" searching, the process takes longer and more speculation is involved, but it is less expensive.
14. The *Thesaurus* authority list may be used for other systems, such as a vertical file, clippings file, book collections, etc.
15. Documents and journal articles are carefully screened before they are accepted into the ERIC system, thus the file must be considered "selective" rather than "up-to-date".
16. The AIM/ARM files are subfiles of ERIC. They can be searched in much

the same manner as RIE and CIJE, but the document numbers must be converted.

17. Most batch systems such as RIC must have the "hits", "flagged", or limited.

To complete this Learning Activity Package, turn to WORKSHEETS 16, 17, and 18 and develop the search strategy for three searches using appropriate descriptors, identifiers and operators. Remove the searches and give them to your instructor or mail them to:

Ms. Nancy Flott
Information Services and Retrieval
State Department of Education
120 East 10th
Topeka, Kansas 66612

Your searches will be judged on criteria developed by a committee consisting of Carolyn Trohoski of Project RISE, King of Prussia, Pennsylvania; Richard K. Herlig, Information Services and Retrieval, Topeka, Kansas; and Roy Tally, WIRE, Madison, Wisconsin. Your searches will be returned to you with any necessary comments and suggestions. Please include with your searches, the completed "LAP Evaluation Form", (WORKSHEET #19). HAPPY SEARCHING!

GLOSSARY

Abstract—informative summary of a document or journal article.

AIM/ARM—Abstracts of Instructional Materials and Abstracts of Resource Materials. Vocational/Technical educational materials (sub-file of ERIC).

Batch Search—Grouping descriptors and printing all hits.

CIJE—*Current Index to Journals in Education.* A guide to periodical literature, indexing more than 700 major educational and education-related publications.

Descriptors—authorized terms used to index and retrieve documents.

ERIC—Educational Resources Information Center. National information network of clearinghouses who collect, process and make available a wide range of educational documents and journal articles.

ERIC Thesaurus—authority list of subject terms (descriptors) used to index ERIC documents and journal articles.

Flag—instructing computer to print only certain documents.

Hit—a retrieved document citation which is considered relevant to the search request.

Identifiers—proper names of persons, geographical locations, trade names, projects, etc. Specific entities, providing additional indexing depth.

Inverted file—alphabetical file of terms with postings (documents assigned the descriptor.

Major descriptor—indicated by *. Primary concept, key subject.

Microfiche sheet—microfilm measuring 4 x 6 containing up to 96 pages of copy.

Minor descriptor—secondary concept, less important subject.

On-line—using terminal to display search results immediately, so that they can be modified to meet the client's needs.

Operators— "AND", "OR", or "NOT". Used to isolate or combine descriptors.

RIC—North Dakota program for searching the ERIC files by computer.

RIE—*Resources in Education.* A collection of abstracts of recently completed reports of outstanding programs and other documents of educational importance.

Rotated descriptor display—Generic list of every descriptor, rotated alphabetically to take into consideration each word of any multiword descriptor.

Search strategy—specific search format used to access citations in an automated retrieval information system.

Search negotiation—defining the information need of the client.

Search precision—a measure of whether the items received as output are relevant to the original inquiry.

Search request—a request in the acceptable language which has been submitted to the computer.

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THE ERIC CLEARINGHOUSES

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Northern Illinois University
College of Education
204 Gabel Hall
DeKalb, Illinois 60115
Telephone: (815) 753-1251
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Early Childhood Education/PS
University of Illinois
805 W. Pennsylvania Ave.
Urbana, Illinois 61801
Telephone: (217) 333-1386
Physiological, psychological, cultural development of children from birth through primary grades, major focus on educational theory, research and practice.

Handicapped and Gifted Children/EC
The Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091
Telephone: (703) 620-3660
Education of children who require special services: gifted, mentally retarded, visually impaired, deaf, physically handicapped, emotionally disturbed, speech and language impaired.

Information Resources/IR
Stanford Center for Research and Development in Teaching
School of Education
Stanford University
Stanford, California 94305
Telephone: (415) 497-3345
Instructional media and technology, libraries and information science. Management of libraries and training of professionals. Technology-based educational techniques (microteaching programed instruction, systems analysis), teaching aids (television, computers, films), education in society (cable television, communications satellites, public television).

Counseling and Personnel Service/CG
The University of Michigan
School of Education Building
Room 2108
Ann Arbor, Michigan 48104
Telephone: (313) 764-9492
Preparation, practice, supervision of counselors and other personnel workers at all educational levels and settings.

Educational Management/EA
University of Oregon
Eugene, Oregon 97403
Telephone: (503) 686-5043
Administration of educational organizations and facilities on elementary and secondary levels.

Higher Education/HE
George Washington University
1 Dupont Circle, Suite 630
Washington, D.C. 20036
Telephone: (202) 296-2597
All research documents on higher education except for teacher education and teaching English.

Junior Colleges/JC
University of California
Powell Library, Room 96
405 Hilgard Ave.
Los Angeles, California 90024
Telephone: (213) 825-3931
Public, private, community and junior colleges, studies on students, staff, curricula, programs, libraries, community services.

Languages and Linguistics/FL
Center for Applied Linguistics
1611 North Kent Street
Arlington, Virginia 22209
Telephone: (703) 528-4312
Teaching French, German, Italian, Russian, Spanish, Latin, classical Greek at all levels, material on linguistics, all related language sciences, teaching of English as a foreign language. Teaching of graduate and undergraduate education.

THE ERIC CLEARINGHOUSES

Reading and Communication Skills/CS
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Urbana, Illinois 61801
Telephone: (217) 328-3870
Reading, teaching of English, speech, debate, journalism, theater.

Science, Mathematics, and Environmental Education/SE
The Ohio State University
1800 Cannon Drive
400 Lincoln Tower
Columbus, Ohio 43210
Telephone: (614) 422-6717
Science and math education, adult and continuing education in science and math. Materials and programs on environmental education.

Teacher Education/SP
1 Dupont Circle, N.W.
Suite 616
Washington, D.C. 20036
Telephone: (202) 293-7280
Preschool and in-service preparation of teachers, supportive school personnel, and teacher educators.

Urban Education/UD
Columbia University, Teachers College
Box 40
525 W. 120th Street
New York, New York 10027
Telephone: (212) 678-3780
Educational, psychological, social general development of urban children who are socially, economically or culturally disadvantaged.

Rural Education and Small Schools/RC
New Mexico State University
Box 3AP
Las Cruces, New Mexico 88003
Telephone: (505) 646-2623
Organization, administration, curriculum, instruction, innovative programs of small schools, rural education, outdoor education, migrant education, Indian and Mexican-American education.

Social Studies/Social Science Education/SO
Social Science Education Consortium, Inc.
855 Broadway
Boulder, Colorado 80302
Telephone: (303) 492-8434
All levels of social science educational/social studies, including Anthropology and archeology, economics, geography, sociology, history, philosophy, psychology and political science.

Test, Measurement and Evaluation/TM
Educational Testing Service
Rosedale Road
Princeton, N.J. 08540
Telephone: (609) 921-9000 ext. 2182
Tests, measurement and evaluation at all levels.

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ANSWER SHEET #1

Sample Search Request #1

My (1) junior high (2) physical education classes need some "livening" up.

Sample Search Request #2

Our (1) university has some days allotted for faculty (2) inservice training. We would like to know what other universities do during this time.

Sample Search Request #1

ANSWER SHEET #2

SEARCH STRATEGY FORM

Name Jane Doe **Search Number** 1539

Describe the topic about which you are seeking information:

My (1) junior high (2) physical education classes need some "livening" up.

VARIABLE – JUNIOR HIGH

VARIABLE – PHYSICAL EDUCATION

VARIABLE –

Sample Search Request #2

ANSWER SHEET #3

SEARCH STRATEGY FORM

Name Mary Smith **Search Number** 3962

Describe the topic about which you are seeking information:

Our university (1) has some days allotted for faculty inservice training (2).

We would like to know what other universities do during this time.

VARIABLE – UNIVERSITY

VARIABLE – INSERVICE TRAINING

VARIABLE –

Sample Search Request #3

ANSWER SHEET #4

SEARCH STRATEGY FORM

Name Sally Jones **Search Number** 3580

Describe the topic about which you are seeking information:

I would like information on individualizing instruction on the elementary level. All subject areas.

VARIABLE – INDIVIDUALIZED INSTRUCTION

From Rotated Descriptor Display	From "Descriptor" Section
INDIVIDUALIZED CURRICULUM	INDIVIDUAL INSTRUCTION
INDIVIDUALIZED INSTRUCTION	INDEPENDENT STUDY
INDIVIDUALIZED PROGRAMS	INDIVIDUAL NEEDS
INDIVIDUALIZED READING	

VARIABLE – ELEMENTARY LEVEL

From Rotated Descriptor Display	From "Descriptor" Section
ELEMENTARY EDUCATION	PRIMARY EDUCATION
ELEMENTARY GRADES	UNGRADED CURRICULUM
ELEMENTARY SCHOOL CURRICULUM	
ELEMENTARY SCHOOL STUDENTS	
ELEMENTARY SCHOOLS	
ELEMENTARY GRADES	
UNGRADED ELEMENTARY PROGRAMS	

VARIABLE – NONE

(Your search should contain all of these descriptors and maybe more)

Sample Search Request #4

ANSWER SHEET #5

SEARCH STRATEGY FORM

Name Sue Brown **Search Number** 6972

Describe the topic about which you are seeking information:

I am interested in techniques and materials suitable for setting up a humanities course at the secondary level.

VARIABLE – HUMANITIES

HUMANITIES
HUMANITIES INSTRUCTION

VARIABLE – SECONDARY LEVEL

SECONDARY EDUCATION
SECONDARY SCHOOLS
SECONDARY GRADES
SENIOR HIGH SCHOOLS
HIGH SCHOOLS

VARIABLE – NONE

(Your search should contain at least all of these descriptors and maybe more)

Sample Search Request #5

SEARCH STRATEGY FORM

ANSWER SHEET #6

Name Bonnie Clark **Search Number** 7830

Describe the topic about which you are seeking information:

I am beginning work on my Master's Thesis in Remedial Reading and am seeking information concerning reading comprehension as it relates to word recognition.

VARIABLE – READING COMPREHENSION

READING COMPREHENSION
COMPREHENSION
READING SKILLS
CONTENT READING
CLOZE PROCEDURE

VARIABLE – WORD RECOGNITION

WORD RECOGNITION
SIGHT METHOD
SIGHT VOCABULARY
RECOGNITION

VARIABLE – NONE

(Your search should contain all of these descriptors and maybe more)

Sample Search Request #6

SEARCH STRATEGY FORM

ANSWER SHEET #7

Name Dick Allen **Search Number** 6943

Describe the topic about which you are seeking information:

We would like to instigate an ungraded system for our district.

How can we find out about other programs? All levels.

VARIABLE – UNGRADED SYSTEM

NONGRADED SYSTEM
NONGRADED CLASSES
UNGRADED PROGRAMS
UNGRADED SCHOOLS
UNGRADED ELEMENTARY PROGRAMS
UNGRADED CURRICULUM

VARIABLE – ALL LEVELS

ELEMENTARY EDUCATION
ELEMENTARY SCHOOLS
ELEMENTARY GRADES
ELEMENTARY SCHOOL STUDENTS
INTERMEDIATE GRADES
SECONDARY EDUCATION
SECONDARY SCHOOLS
SECONDARY GRADES
SENIOR HIGH SCHOOLS
HIGH SCHOOLS

VARIABLE – NONE

(Your search should contain at least these descriptors and maybe more)

SEARCH STRATEGY FORM

Name ANSWER SHEET #8 Bob Wilson Search Number 3492

Describe the topic about which you are seeking information:

We are hiring a bilingual teacher this year and would like to know about programs and materials other districts have. Emphasis will probably be on reading and social studies. Secondary level Spanish.

VARIABLE – BILINGUAL (primarily Spanish)

BILINGUAL EDUCATION
BILINGUAL STUDENTS
BILINGUAL TEACHERS
MEXICANS
SPANISH AMERICANS

VARIABLE – SECONDARY LEVEL

SECONDARY EDUCATION
JUNIOR HIGH SCHOOLS
SENIOR HIGH SCHOOLS
HIGH SCHOOLS
SECONDARY SCHOOLS
SECONDARY GRADES

VARIABLE – NONE

(Your search should contain at least these descriptors and maybe more)

ANSWER SHEET #9

HUMANITIES

ED001191	ED002220	ED002274
ED011658	ED012199	ED012200
ED013458	ED013570	ED014007
ED014493	ED014806	ED014818
ED015210	ED015544	ED015946

SECONDARY EDUCATION

ED010841	ED011869	ED011874
ED011926	ED012199	ED012200
ED012241	ED012691	ED012792
ED012805	ED013186	ED013190
ED013223	ED013743	ED013780
ED013791	ED013984	ED014036
ED014045	ED014230	ED014347
ED014351	ED014460	ED014483
ED014493	ED015141	ED015144
ED015156	ED015176	ED015178

ANSWER SHEET #10

READING COMPREHENSION.OR.

COMPREHENSION.OR.

READING SKILLS.OR.

CONTENT READING.AND.

WORD RECOGNITION.OR.

SIGHT METHOD.OR.

SIGHT VOCABULARY.OR.

RECOGNITION

ANSWER SHEET #11

HUMANITIES INSTRUCTION.OR.

HUMANITIES.AND.

SECONDARY EDUCATION.OR.

SECONDARY SCHOOLS.OR.

SECONDARY GRADES.OR.

SENIOR HIGH SCHOOLS.OR.

HIGH SCHOOLS

ANSWER SHEET #12

SEARCH #1

(HUMANITIES.OR.HUMANITIES INSTRUCTION).AND.(SECONDARY EDUCATION.OR.SECONDARY SCHOOLS.OR.SECONDARY GRADES .OR.SENIOR HIGH SCHOOLS.OR.HIGH SCHOOLS)$

SEARCH #2

(READING COMPREHENSION.OR.COMPREHENSION.OR.READING SKILLS.OR.CONTENT READING.OR.CLOZE PROCEDURE).AND. (WORD RECOGNITION.OR.SIGHT METHOD.OR.SIGHT VOCABULARY .OR.RECOGNITION).AND.(ELEMENTARY EDUCATION.OR.ELEMEN TARY SCHOOLS.OR.ELEMENTARY GRADES.OR.ELEMENTARY SCHOOL STUDENTS)$

ANSWER SHEET #13

(READING READINESS TESTS.OR.READING LEVEL.OR.*READING).AND.
(*ENGLISH.OR.ENGLISH DEPARTMENTS.OR.*ENGLISH PROGRAMS)$

(LEARNING LABORATORIES.OR.LEARNING CENTERS.OR.*INSTRUCTIONAL
MATERIALS CENTERS).AND(*SOCIAL STUDIES.OR.*SOCIAL SCIENCES)$

(*INSERVICE EDUCATION)$

SEARCH STRATEGY FORM

ANSWER SHEET #14

Name Sylvia Scott **Search Number** 7429

Describe the topic about which you are seeking information:

We want to revamp our nursery school and are considering several different programs. We would like to know more about the Montessori program but also need some other programs to consider before making a final decision.

VARIABLE – NURSERY SCHOOL

(NURSERY SCHOOLS.OR.
PRESCHOOL EDUCATION.OR.
EARLY CHILDHOOD EDUCATION.OR.
PRESCHOOL LEARNING.OR.
PRESCHOOL CHILDREN.OR.
EARLY CHILDHOOD).AND.

VARIABLE – PROGRAMS (Montessori program, primarily)

(PRESCHOOL PROGRAMS.OR.
PRESCHOOL CURRICULUM.OR.
MONTESSORI METHOD.OR.
MONTESSORI.OR.
MONTESSORI APPROACH.OR.
MONTESSORI CURRICULUM.OR.
MONTESSORI METHODS.OR.
MONTESSORI PRESCHOOLS.OR.
MONTESSORI SCHOOLS)$

VARIABLE – NONE

(Your search should include all of these descriptors and identifiers and maybe more)

SEARCH STRATEGY FORM

ANSWER SHEET #15

Name Judy Walters **Search Number** 7832

Describe the topic about which you are seeking information:

I would like to individualize my 5th grade math class this year. I need all types of materials -- curriculum guides, research, or programmed materials.

VARIABLE – MATH

(*MATHEMATICS.OR.
*MATHEMATICS EDUCATION.OR.
MATHEMATICS INSTRUCTION.OR.
MATHEMATICS MATERIALS.OR.
MATHEMATICAL CONCEPTS).AND.

VARIABLE – INDIVIDUALIZED

((*INDIVIDUALIZED INSTRUCTION.OR.
INDIVIDUALIZED CURRICULUM.OR.
INDIVIDUALIZED PROGRAMS.OR.
INDIVIDUAL INSTRUCTION.OR.
INDIVIDUALLY GUIDED EDUCATION.OR.
INDIVIDUALLY PRESCRIBED INSTRUCTION).AND.

VARIABLE – 5th GRADE

(GRADE 5.OR.
INTERMEDIATE GRADES))$

(Your search should include all of these descriptors and identifiers and maybe mo)

WHAT IS THE QUESTION?
(A guide for search negotiation)

by
Nancy Flott

Probably the most vital part of searching a data base is wording the question so as to obtain the information desired. As an intermediary between the client and the computer, the negotiator will need to be skillful in questioning the client so as to clearly define his/her needs. Some clients may not be aware of the real need, but through proper questioning, both the client and the negotiator can discover an appropriate way to express the search request. The negotiator, to be really effective, will need to be knowledgeable in the field to be searched, as well as skillful in inquiry techniques. Some key questions which might be used as guidelines during the inquiry interview might be:

1. What does the client want? AND what doesn't he/she want? (possibly equally important!) Are there "maybes", alternatives, or fringe areas that should be included?

2. What type of information does he/she want? Curriculum guides? Research projects? Programs? Speeches? Journal articles? Bibliographies?

3. How much material does he/she want? Is it an awareness search? An in-depth search? What source has he/she already investigated?

4. What is the role of the client? His/Her position? His/Her responsibilities? Will this influence your search strategy?

5. Is it a "state of the art" search? Or retrospective?

6. Is there an age group, grade level or specific type of person to be considered in this search? Would it be better to "not" out the unwanted groups or levels?

7. How will the information be used? Why does he/she need it?

8. When is the information needed?

9. Does he/she know authorities in the field -- names, institutions, organizations, actual programs (by name)?

10. Have you listened carefully and kept your own personal biases out?

Some searches will come to you as the negotiator without face-to-face interaction. You will need to be cautious when interpreting information that is in written form. A few hints for "search by mail" are:

1. Encourage clients to write out their needs in paragraph form. It is very difficult to prioritize a list of terms, but easy to identify key concepts by underlining words in paragraphs.

2. Encourage clients to be specific and be sure to include limitations.

3. Renegotiate by phone if there is any question about the search.

4. Carefully review the search results to be sure they are relevant. Highlight pertinent abstracts.

5. Conduct a follow-up evaluation and and renegotiate and research if necessary.

6. Maintain good rapport with regular and potential clients to make negotiation both by mail and in person easier and quicker.

NF/D/TA/ae

COMPUTERIZED INFORMATION RETRIEVAL

Worksheets
to accompany

MANUAL FOR SEARCH STRATEGY LEARNING ACTIVITY PACKAGE

developed by
Nancy Flott

WORKSHEET #1

Sample Search Request #1

My junior high physical education classes need some "livening" up.

Sample Search Request #2

Our university has some days allotted for faculty inservice training. We would like to know what other universities do during this time.

Sample Search Request #1

WORKSHEET #2

SEARCH STRATEGY FORM

Name Jane Doe **Search Number** 1589

Describe the topic about which you are seeking information:

My junior high physical education classes need some "livening" up.

VARIABLE –

VARIABLE –

VARIABLE –

Sample Search Request #2

WORKSHEET #3

SEARCH STRATEGY FORM

Name Mary Smith Search Number 3962

Describe the topic about which you are seeking information:

Our university has some days allotted for faculty inservice training.

We would like to know what other universities do during this time.

VARIABLE –

VARIABLE –

VARIABLE –

Sample Search Request #3

WORKSHEET #4

SEARCH STRATEGY FORM

Name Sally Jones **Search Number** 3580

Describe the topic about which you are seeking information:

I would like information on individualizing instruction on the elementary level. All subject areas.

VARIABLE –

VARIABLE –

VARIABLE –

Sample Search Request #4

WORKSHEET #5

SEARCH STRATEGY FORM

Name Sue Brown Search Number 6972

Describe the topic about which you are seeking information:

I am interested in techniques and materials suitable for setting up a humanities course at the secondary level.

VARIABLE –

VARIABLE –

VARIABLE –

WORKSHEET #6

Sample Search Request #5
SEARCH STRATEGY FORM

Name Bonnie Clark **Search Number** 7830

Describe the topic about which you are seeking information:

I am beginning work on my Master's Thesis and am seeking information concerning reading comprehension as it relates to word recognition.

VARIABLE –

VARIABLE –

VARIABLE –

Sample Search Request #6

SEARCH STRATEGY FORM

WORKSHEET #7

Name Dick Allen **Search Number** 6943

Describe the topic about which you are seeking information:

- We would like to instigate an ungraded system for our district.

How can we find out about other programs? All levels.

VARIABLE –

VARIABLE –

VARIABLE –

Sample Search Request #7

SEARCH STRATEGY FORM

WORKSHEET #8

Name Bob Wilson Search Number 3492

Describe the topic about which you are seeking information:

We are hiring a bilingual teacher this year and would like to know about programs and materials other districts have. Emphasis will probably be on reading and social studies. Secondary level. Spanish.

VARIABLE –

VARIABLE –

VARIABLE –

WORKSHEET #9

HUMANITIES

ED001191	ED002220	ED002274
ED011658	ED012199	ED012200
ED013458	ED013570	ED014007
ED014493	ED014806	ED014818
ED015210	ED015544	ED015946

SECONDARY EDUCATION

ED010841	ED011869	ED011874
ED011926	ED012199	ED012200
ED012241	ED012691	ED012792
ED012805	ED013186	ED013190
ED013223	ED013743	ED013780
ED013791	ED013984	ED014036
ED014045	ED014230	ED014347
ED014351	ED014460	ED014483
ED014493	ED015141	ED015144
ED015156	ED015176	ED015178

WORKSHEET #10

READING COMPREHENSION

COMPREHENSION

READING SKILLS

CONTENT READING

WORD RECOGNITION

SIGHT METHOD

SIGHT VOCABULARY

RECOGNITION

WORKSHEET #11

HUMANITIES INSTRUCTION

HUMANITIES

SECONDARY EDUCATION

SECONDARY SCHOOLS

SECONDARY GRADES

SENIOR HIGH SCHOOLS

HIGH SCHOOLS

WORKSHEET #12

SEARCH #1

HUMANITIES .OR. HUMANITIES INSTRUCTION .AND. SECONDARY EDUCATION .OR. SECONDARY SCHOOLS .OR. SECONDARY GRADES .OR. SENIOR HIGH SCHOOLS .OR. HIGH SCHOOLS

SEARCH #2

READING COMPREHENSION .OR. COMPREHENSION .OR. READING SKILLS .OR. CONTENT READING .OR. CLOZE PROCEDURE .AND. WORD RECOGNITION .OR. SIGHT METHOD .OR. SIGHT VOCABULARY .OR. RECOGNITION .AND. ELEMENTARY EDUCATION .OR. ELEMENTARY SCHOOLS .OR. ELEMENTARY GRADES .OR. ELEMENTARY SCHOOL STUDENTS

WORKSHEET #13

Limit the following searches by adding an * to descriptors with large files. (Use the Descriptor/Identifier Usage Report in RIE/CIJE). Check your answers with ANSWER SHEET #13.

(READING READINESS TESTS.OR. READING LEVEL.OR. READING)

.AND.(ENGLISH.OR. ENGLISH DEPARTMENTS.OR. ENGLISH PROGRAMS)$

(LEARNING LABORATORIES.OR. LEARNING CENTERS.OR. INSTRUCTIONAL MATERIALS CENTERS).AND.(SOCIAL STUDIES.OR. SOCIAL SCIENCES)$

(INSERVICE EDUCATION)$

WORKSHEET #14 **SEARCH STRATEGY FORM**

Name Sylvia Scott Search Number 7429

Describe the topic about which you are seeking information:

We want to revamp our nursery school and are considering several different programs. We would like to know more about the Montessori program, but also need some other programs to consider before making a final decision.

VARIABLE –

VARIABLE –

VARIABLE –

SEARCH STRATEGY FORM

WORKSHEET #15

Name Judy Walters Search Number 7832

Describe the topic about which you are seeking information:

I would like to individualize my 5th grade math class this year. I need all types of materials: curriculum guides, research, or program descriptions.

VARIABLE –

VARIABLE –

VARIABLE –

SEARCH STRATEGY FORM

WORKSHEET #16

Name Janet Williams Search Number 3448

Describe the topic about which you are seeking information:

I am the director of a district-wide Instructional Materials Center. We are looking for career education materials for Special Education children in the regular classroom and also in Special Education classes. We want to know what programs are being used and how to implement them. Also would be interested in research in this area. We have a committee working on this subject. They have met once and will continue to meet regularly. They have asked me to help them; however, I am not on the committee.

VARIABLE –

VARIABLE –

VARIABLE –

WORKSHEET #17 **SEARCH STRATEGY FORM**

Name Tom Woods **Search Number** 1357

Describe the topic about which you are seeking information:

I am the chairman of the education department of a state college. I would like to know about ways that institutions of higher education provide professional inservice development for teachers in the field. What role does higher education play in fostering inservice education? What kinds of workshops, conferences, and seminars are provided by institutions of higher education to improve the competence of teachers? All levels -- elementary and secondary. We need to upgrade our service to teachers in the field.

VARIABLE –

VARIABLE –

VARIABLE –

WORKSHEET #18

SEARCH STRATEGY FORM

Name Carol Dannon Search Number 3572

Describe the topic about which you are seeking information:

I am a reading consultant. I work with an elementary school that has some Title I money that we can use for teacher aides. We would like to know how other schools use them and what kind of training they give them. We have not used them before.

VARIABLE –

VARIABLE –

VARIABLE –

WORKSHEET #19

LAP EVALUATION

Please rate this Learning Activity Package according to the following points using the scale indicated at right:

	Poor				Excellent
1. Format	1	2	3	4	5
2. Language	1	2	3	4	5
3. Style	1	2	3	4	5
4. Clarity	1	2	3	4	5
5. Usefulness	1	2	3	4	5

Would you recommend this LAP to someone wishing to learn how to search the ERIC files?
_____ Yes _____ No. **Other data bases?** _____ Yes _____ No.